

SAMBALPURI BAZAAR

**A PROJECT REPORT
for
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Submitted by

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**Under the Supervision of
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CERTIFICATE

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ABSTRACT

Sambalpuri handloom, renowned for its intricate weaving patterns and cultural significance, represents the rich heritage of Odisha. However, local artisans face challenges such as limited online visibility, dependence on offline markets, fragmented tailoring processes, and lack of direct customer engagement. To address these gaps, this project introduces **Sambalpuri Bazaar – a full-stack digital marketplace designed to bridge tradition and technology.**

The platform serves as a **one-stop destination** for customers to purchase both **ready-made Sambalpuri garments** and **customized outfits** tailored to their preferences. Through an intuitive customer interface, users can register, browse collections, add items to cart, and place secure orders. A dedicated custom order form allows customers to select fabrics, dress types, sizes, and additional customization requests. Meanwhile, artisans and administrators are empowered through the **Weaver Module**, enabling them to manage products, update inventory, process orders, respond to customization requests, and view customer feedback.

The system is built using **React.js** for the frontend, **Spring Boot** for the backend, **MongoDB** for database management, and **Razor pay** for secure online transactions. This integration ensures a scalable, reliable, and user-friendly platform. Beyond technical achievement, the project contributes to **socio-economic development** by providing fair market access to artisans, reducing middlemen dependency, and aligning with **UN SDG 8 (Decent Work and Economic Growth).**

By blending **cultural preservation with modern e-commerce practices**, Sambalpuri Bazaar not only strengthens the handloom industry but also creates opportunities for sustainable growth and global recognition.

Keywords: Sambalpuri Handloom, E-commerce, Customization, React.js, Spring Boot, Artisan Empowerment

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Chapter 1: Introduction

1.1 Background of the Problem

Handloom weaving is one of the most significant traditional industries in India, deeply rooted in rural culture and artistic heritage. Among India's diverse handloom crafts, **Sambalpuri Handloom** from Western Odisha holds a distinguished legacy. It is globally admired for its **tie-dye art known as Bandha**, where intricate motifs are created directly into the threads before weaving. These motifs often represent cultural symbols such as shankha (shell), chakra (wheel), phula (flower), and animals that reflect Odisha's rich history and identity. The craftsmanship of Sambalpuri artisans is not just a profession but a generational heritage that carries emotional, social, and cultural significance.

Despite its immense potential and international recognition, the industry faces persistent challenges that threaten its sustainability. The majority of Sambalpuri weavers, referred to locally as "**Bunakar**", belong to rural communities where digital literacy and business exposure remain limited. Their earnings depend heavily on traditional offline marketplaces, exhibitions, and local merchants who often control pricing and distribution. This dependency creates **middlemen exploitation**, where artisans receive only a small portion of the product's final value.

Another major barrier is **lack of direct access to customers**. Many artisans are unable to showcase their work globally due to poor online representation and insufficient awareness about e-commerce platforms. As a result, the market reach remains restricted, while international buyers who genuinely seek authentic handloom products often cannot connect with the real creators.

Additionally, the modern consumer market increasingly prefers **customized clothing**, especially in ethnic wear. However, the absence of online custom tailoring services forces customers to purchase fabric from one vendor and find a separate tailor, making the experience cumbersome and discouraging. This gap reduces the attractiveness of Sambalpuri products in comparison to readily available machine-made fashion.

Online marketplaces that do list handloom products often struggle with authenticity concerns. Duplicate or powerloom-manufactured fabrics are sold as "Sambalpuri

handloom,” causing distrust and loss of revenue for actual weavers. Due to weaker branding and marketing of authentic products, artisans remain under-recognized, and the heritage loses its deserved value in the global market.

Overall, the handloom sector struggles with multiple interconnected issues such as:

- Limited digital transformation and market accessibility
- Absence of branding and storytelling around cultural art
- Inadequate technology support for sales and inventory
- Lack of a customer–weaver interactive ecosystem

These gaps collectively affect artisan livelihoods, cultural preservation, and industry growth. Therefore, **a dedicated and digitally empowered e-commerce platform** is crucial to overcoming these challenges. Such a system must provide:

- Direct marketplace access for artisans
- Tools for showcasing authentic handloom products
- Support for personalization and tailoring services
- Secure online transactions and order tracking
- Better branding and customer engagement

1.2 Problem Statement

Existing e-commerce platforms largely focus on mass-produced clothing and general fashion retail, but they fail to cater to the specialized needs of traditional handloom craft sellers, particularly those dealing in customized ethnic wear. Sambalpuri handloom, with its unique tie-dye technique (Bandha), cultural significance, requires personalized attention and direct interaction between artisans and customers. Currently, customers who wish to purchase tailored Sambalpuri garments face multiple challenges:

- **Fragmented Buying Process:** Customers often have to purchase raw fabric from a shop and then search separately for a skilled tailor, leading to inefficiencies and delays.
- **Lack of Direct Communication:** There is no platform that allows customers to interact directly with weavers, discuss design preferences, or clarify fabric authenticity.

- **Limited Customization Options:** Existing platforms rarely support comprehensive dress customization or order personalization based on size, pattern, or color preferences.
- **Absence of Integrated Order Management:** There is no unified system that allows for seamless inventory management, order tracking, or feedback collection for both weavers and customers.

In essence, there is a **critical gap in the digital marketplace**: there is no dedicated, secure, and transparent platform where customers can purchase customized Sambalpuri garments directly from traditional weavers. Such a platform should ensure:

1. **Seamless Online Purchase:** Allowing customers to browse, select, and buy Sambalpuri clothing with detailed product information.
2. **Personalized Customization:** Options for tailoring garments according to customer preferences, including measurements, patterns, and colors.
3. **Direct Weaver-to-Customer Interaction:** Facilitating communication for design consultations, clarifications, and updates.
4. **Secure and Transparent Transactions:** Ensuring safe online payments, trust in product authenticity, and fair compensation for artisans.
5. **Comprehensive Management Tools:** Features for inventory tracking, order management, and customer feedback to improve efficiency and satisfaction for weavers.

Without such a platform, the rich tradition of Sambalpuri handloom faces commercialization challenges, and customers seeking authentic, customized ethnic wear continue to experience inconvenience, lack of transparency, and limited access to skilled artisans.

1.3 Aims and Objectives

The primary aim of this project is to design and develop a **full-stack web-based marketplace** that facilitates the online shopping and **customization of Sambalpuri handloom garments**, while simultaneously **empowering traditional artisans**. The platform seeks to bridge the gap between weavers and customers by providing a secure,

transparent, and user-friendly environment for direct transactions, personalized garment orders, and effective management of orders and feedback.

Functional Objectives:

- **Customer Account & Product Browsing:** Allow users to create personalized accounts, browse a catalog of Sambalpuri handloom garments, and filter products based on categories, designs, or preferences.
- **Secure Online Ordering & Payment:** Implement safe and reliable online payment methods along with order confirmation and invoice generation.
- **Customization Features:** Enable customers to select fabrics, colors, patterns, and sizes, or even request custom designs directly from weavers.
- **Order Tracking & Communication:** Provide real-time order tracking, direct messaging with weavers for design discussions, and a feedback system for post-purchase reviews.
- **Admin/Weaver Dashboard:** Develop a comprehensive dashboard for artisans and administrators to manage inventory, process orders, monitor customer interactions, and generate reports for better business insights.

Socio-Economic Objectives:

- **Expand Market Reach for Weavers:** Enable artisans to connect directly with a global customer base, overcoming geographic limitations.
- **Ensure Fair Pricing:** Eliminate middlemen exploitation by allowing direct transactions between weaver and customer, ensuring fair wages for artisans.
- **Promote Cultural Heritage:** Showcase and preserve the traditional Sambalpuri handloom craft, increasing global awareness and appreciation of Indian textiles.
- **Support Sustainable Livelihoods:** Strengthen the economic independence of handloom artisans by creating a stable and scalable source of income.
- **Encourage Digital Skill Adoption:** Facilitate the adoption of technology by artisans and administrators for better business management and digital literacy.

Alignment with Global Goals:

This system directly contributes to **United Nations Sustainable Development Goal (UN SDG) 8: Decent Work and Economic Growth**, by promoting productive

employment, fair economic opportunities, and sustainable entrepreneurship for traditional artisans in the handloom sector.

1.4 Scope of Project

The project focuses on creating an **integrated web-based marketplace** for Sambalpuri handloom garments, providing features for both **customers** and **weavers/admin**. It aims to streamline online shopping, garment customization, and direct communication with artisans, while also facilitating efficient management of orders and inventory.

In Scope (Initial Version):

- **Responsive Web UI:** A modern, user-friendly interface accessible on desktops, tablets, and mobile browsers.
- **Customer & Admin Authentication:** Secure login and registration system for customers, weavers, and administrators with role-based access control.
- **Wishlist, Cart & Checkout:** Allow customers to add products to wishlist, manage a shopping cart, and complete purchases through a streamlined checkout process.
- **Order Tracking Dashboard:** Real-time updates on order status for both customers and weavers.
- **Razorpay Payment Gateway:** Integration of a secure and reliable payment system for smooth financial transactions.
- **Customization Request Form:** Enable customers to request personalized garments, specifying fabric, design, size, and other preferences.
- **Inventory & Product Management:** Tools for weavers/admins to add, update, and manage product listings and stock availability.
- **Feedback & Review System:** Customers can rate and provide reviews on products and services, fostering trust and transparency.

Out of Scope (Initial Version):

- **Mobile Application:** No native iOS or Android app; focus is on responsive web design.

- **AI-Based Product Recommendations:** Personalized suggestions using machine learning are not included in the first version.
- **Automated Logistics/Delivery Network:** Integration with third-party logistics or automated delivery tracking is not implemented.
- **Multi-Language Support:** Platform initially supports only English.

1.5 Hardware and Software Requirements

1.5.1 Hardware Requirements

Requirement	Specification
Processor	Intel i5 or higher
RAM	8GB minimum (16GB recommended for development)
Storage	500GB HDD/SSD
OS	Windows / Linux / macOS
Connectivity	Stable broadband for hosting & APIs

1.5.2 Software Requirements

Category	Technology Stack Used
Frontend	React.js, Bootstrap, Axios
Backend	Spring Boot, Spring Data JPA, Spring Security
Database	MongoDB
Dev Tools	VS Code, Maven, GitHub, Postman
Hosting	Localhost / Cloud deployment (optional)
Payment API	Razor pay

This stack ensures high performance, scalability, modularity, and rapid development.

Chapter 2: Introduction to Existing System

2.1 Existing Solutions and its limitation

Traditional handloom markets in Odisha, particularly for Sambalpuri products, have historically relied on **offline retail shops, local exhibitions, and occasional government-organized fairs** to reach customers. While these methods have preserved the craft for generations, they are **inadequate for sustainable growth in the modern digital era**, where online presence and direct-to-consumer sales are increasingly essential.

Existing Ecosystem for Sambalpuri Handloom:

1. **Local Retail Shops:** Shops in Sambalpur, Bargarh, and Sonepur serve as primary distribution points. While they offer physical product access, their reach is limited to local or regional customers.
2. **Handicraft Exhibitions & Fairs:** Government or private exhibitions provide temporary exposure but involve high logistical costs and limited duration, restricting consistent sales.
3. **Government Outlets:** Initiatives like Boyanika and Utkalika promote craft sales and provide some institutional support. However, they often operate under strict regulations and lack personalized customer engagement.
4. **Generic E-Commerce Platforms:** Platforms like Amazon and Flipkart list handloom products but are not tailored for artisan-led customization and often prioritize mass-produced goods.

Although these channels provide **some exposure to customers**, they **do not directly support artisan-led selling** or ensure **fair compensation**, and many weavers continue to face challenges in adopting digital commerce effectively.

Limitations of the Existing System:

Area of Concern	Major Limitation
Sales Channels	Overdependence on physical markets restricts geographic reach and limits customer access.

Area of Concern	Major Limitation
Fair Pricing	Middlemen exploit the supply chain, reducing artisan profit margins and discouraging growth.
Customization	No online support for tailoring or personalized orders; customers cannot customize patterns, sizes, or designs digitally.
Product Trust	Absence of verification leads to fake or low-quality replicas, affecting customer confidence.
Digital Capability	Many artisans lack the technical tools, knowledge, and infrastructure to manage online businesses effectively.
Inventory Management	Manual tracking of products and orders leads to delays, stockouts, or overbooking.
Customer Feedback	No structured system for collecting reviews or suggestions, limiting service improvements.

Outcome of These Limitations:

- **Customer Dissatisfaction:** Inability to access authentic, customized products conveniently, leading to frustration and potential disengagement.
- **Artisan Revenue Loss:** Limited market reach, middlemen exploitation, and low online adoption result in decreased profits for weavers.
- **Declining Sustainability:** These factors combined threaten the long-term economic viability of the Sambalpuri handloom industry and hinder its global growth potential.

Need for a New System:

Given the operational, technological, and market limitations, there is a clear **need for a dedicated digital platform** that:

- Connects weavers directly with customers
- Facilitates online ordering, customization, and secure payments
- Provides tools for inventory and order management

- Promotes authenticity, trust, and fair pricing
- Such a system can **empower artisans, enhance customer experience, and sustain the cultural heritage of Sambalpuri handloom** in the digital economy.

2.2 Motivation

The motivation for developing a dedicated Sambalpuri handloom marketplace arises from a combination of **economic, technological, cultural, and social factors**. The project aims to address the challenges faced by traditional artisans while modernizing the way their products are marketed and sold.

1. Economic Motivation:

- **Increase Profit Margins for Weavers:** Traditional sales channels rely heavily on intermediaries, which often reduce the profit received by artisans. A direct-to-customer platform ensures fair pricing and better compensation for their craft.
- **Sustainable and Continuous Income:** By moving to an online platform, weavers can reach customers year-round, rather than relying solely on seasonal fairs or exhibitions, leading to a more stable and predictable revenue stream.
- **Market Expansion:** Digital sales open up access to national and international markets, allowing artisans to reach buyers who may never visit local fairs or shops.

2. Technological Motivation:

- **Modern E-Commerce Platform:** The platform integrates contemporary e-commerce functionalities tailored to the handloom industry. Key features include:
 - **Fabric Selection:** Customers can browse available fabrics and choose their preferred material.
 - **Custom Tailoring:** Support for personalized garments including size, pattern, and color customization.
 - **Order Management:** Real-time tracking of orders, inventory management, and updates for both customers and weavers.
 - **Secure Online Payments:** Integration of reliable payment gateways to ensure smooth and trustworthy transactions.

- **Digital Skill Adoption:** Encouraging artisans to adopt technology strengthens their ability to manage online businesses independently, contributing to digital literacy and long-term self-sufficiency.

3. Cultural Motivation:

- **Preservation of Sambalpuri Heritage:** Sambalpuri handloom represents centuries of craftsmanship and cultural symbolism. The platform provides a way to **safeguard and promote this unique art form**.
- **Global Recognition:** By enabling online sales, traditional designs gain visibility among international audiences, increasing appreciation for Indian textiles and cultural heritage.
- **Support Government Initiatives:** Aligns with initiatives like “**Make in India**” and “**Vocal for Local**”, which encourage indigenous craftsmanship, self-reliance, and the promotion of local businesses on a national and global scale.

4. Social Motivation:

- **Empowerment of Artisans:** The platform allows weavers to manage their businesses, connect with customers directly, and gain fair recognition for their work.
- **Encourage Youth Participation:** By modernizing sales and marketing, the project makes weaving a viable and attractive career for younger generations, helping to **sustain traditional knowledge and skills**.
- **Community Development:** Supporting artisans financially and digitally contributes to **rural economic growth**, fostering socio-economic development in handloom-dependent regions.

Chapter 3: Proposed System

3.1 Proposed Solution

The proposed system, **Sambalpuri Bazaar**, is envisioned as a **comprehensive full-stack web application** aimed at transforming the traditional handloom and tailoring ecosystem for Sambalpuri garments into a **digitally accessible, efficient, and customer-centric platform**. This solution addresses the limitations of existing offline and generic e-commerce channels by offering a **dedicated digital marketplace tailored specifically for Sambalpuri artisans and customers**. It provides a unified platform where:

- Customers can **browse and purchase ready-made garments** or **place custom tailoring requests**.
- Weavers/Admins can **manage products, inventory, and orders digitally**, streamlining business operations.
- Secure online transactions are facilitated through **Razor pay**, ensuring reliable and trustworthy payments.
- Real-time **order tracking and customer feedback** enable transparency and improved service quality.

Key Innovation:

Sambalpuri Bazaar represents the **first integrated digital ecosystem** that seamlessly combines:

- **Traditional handloom craft with modern e-commerce functionality**
- **Tailoring services for custom garment orders**
- **Direct Artisan-to-Customer interaction**

This integration not only **simplifies the buying and selling process** but also **empowers artisans by giving them control over pricing, inventory, and customer engagement**. Moreover, it serves as a **cultural preservation platform**, promoting Sambalpuri handloom to **national and global audiences**, thereby contributing to the sustainability and growth of this traditional craft.

Impact:

- Customers gain convenient access to authentic, customized Sambalpuri garments.
- Artisans achieve **fair pricing, increased market reach, and operational efficiency**.
- The system strengthens **cultural heritage, digital adoption among rural artisans, and global recognition** of Sambalpuri craftsmanship.

3.2 Key Features

1. Customer Features:

- **Registration/Login:** Secure authentication using email and password.
- **Product Browsing & Details:** Category-based search with images, fabric information, patterns, pricing, and reviews.
- **Wishlist & Cart:** Save favorites and purchase multiple items together.
- **Custom Order Form:** Specify fabric, type, size, style, and special instructions for tailored garments.
- **Secure Checkout:** Payment through Razorpay.
- **Order Tracking & Feedback:** Monitor order status and provide ratings to improve artisan credibility.

2. Admin/Weaver Features:

- **Role-Based Dashboard:** Secure login for weavers/admins with access to relevant modules.
- **Product & Inventory Management:** Add, update, delete products and manage stock levels.
- **Order Handling:** Accept, tailor, process, and dispatch orders efficiently.
- **Custom Requests:** Communicate with customers for clarifications on personalized orders.
- **Payment & Feedback Monitoring:** Track payments received and analyze customer reviews.

3. System Goals (Summary of Key Focus Areas):

- **User Experience:** Smooth and intuitive online shopping and customization.
- **Artisan Empowerment:** Direct interaction with customers, bypassing intermediaries.
- **Business Management:** Efficient handling of orders, payments, and inventory.
- **Digital Transformation:** Enable artisans to adopt e-commerce effectively.

3.3 Advantages Over Existing System

Existing System Drawbacks	Proposed System Benefits
No direct weaver–customer interaction	Direct marketplace ensures fair pricing and transparent communication
Custom tailoring not available online	Built-in customization module allows personalized orders
Limited cultural brand representation	Dedicated platform highlighting Sambalpuri heritage globally
High commission on mainstream platforms	Minimal or no middlemen profit cuts
Low digital skills among artisans	Simple, intuitive UI designed for rural artisans
Weak trust/feedback system	Verified artisans, review and rating system builds customer confidence

Chapter 4: System Architecture

4.1 Overall System Design

The Sambalpuri Bazaar Admin & Product Management System is designed using a **layered web application architecture** based on the **Model–View–Controller (MVC)** design pattern. The system separates presentation, business logic, and data access layers to ensure better maintainability, scalability, and security.

The **admin** acts as the primary user of the system and interacts with the application through a **web browser**. The frontend is developed using **HTML, CSS, and Thymeleaf templates**, which provide dynamic and user-friendly pages for login, dashboard, and CRUD operations.

When the admin performs any action such as adding a product, updating user details, or viewing orders, the request is sent to the **Spring Boot Controller layer**. Controllers handle HTTP requests, validate inputs, manage sessions, and forward the request to the **Service layer**.

The **Service layer** contains the core business logic of the application. It processes requests such as validating admin credentials, handling product image uploads, managing product and user data, and coordinating operations between controllers and repositories.

The **Repository layer** uses **Spring Data JPA** and **Hibernate** to interact with the **MySQL database**. It performs all database operations such as insert, update, delete, and fetch without writing complex SQL queries.

Product images uploaded by the admin are stored in the **static uploads directory** on the server, and the image path is saved in the database. This allows efficient retrieval and display of product images in the admin dashboard.

Overall, the system design ensures:

- Clear separation of concerns
- Easy maintenance and debugging
- Secure and efficient data management

4.2 Architecture Diagram

The architecture of the Sambalpuri Bazaar system follows a **three-tier MVC-based architecture**. The diagram represents how different components of the system interact with each other.

Description of the Architecture Diagram:

1. Presentation Layer

- Consists of HTML, CSS, and Thymeleaf templates
- Displays admin login page, dashboard, product forms, and tables
- Accepts user input and sends HTTP requests to the controller layer

2. Controller Layer

- Implemented using Spring MVC controllers
- Handles incoming HTTP requests from the presentation layer
- Manages session handling and request routing
- Forwards requests to the service layer and returns responses to the UI

3. Service Layer

- Contains business logic of the application
- Validates admin credentials
- Processes product, user, and order management logic
- Handles image upload and file storage logic

4. Repository Layer

- Uses Spring Data JPA repositories
- Communicates with the database
- Performs CRUD operations on Admin, User, Product, and Orders entities

5. Database Layer

- MySQL database
- Stores admin, user, product, and order details
- Stores image path references for product images

6. File Storage

- Stores product images in the server's static uploads directory
- Image paths are retrieved and displayed using Thymeleaf

4.3 Modules Description

- The Sambalpuri Bazaar system consists of two major functional modules:
Customer Module
Admin/Weaver Module
- Both modules interact with the backend server and database to enable seamless online shopping, customization, inventory control, and order management.
- Each module is explained below:

4.3.1 Customer Module

- This module handles all operations performed by end-users who shop or request custom tailoring on the platform.

Feature	Description
User Registration & Login	Secure sign-up and login using credentials
Product Browsing	Explore category-wise Sambalpuri items like Sarees, Kurtas, Fabrics
Search & Filter	Search by color, pattern, fabric type, price, etc.
Product Details	View info like material, price, delivery time, ratings
Cart Management	Add, update, and remove products
Wishlist	Save items for later purchase
Custom Order Form	Enter fabric choice, size, measurements, style preferences
Payment Integration	Secure online payment using Razorpay
Order Tracking	View order status: Placed → Processing → Dispatched → Delivered
Ratings & Reviews	Provide feedback after delivery

Purpose

- Enhances user convenience, decision-making, and engagement with authentic handloom products.

4.3.2 Admin/Weaver Module

- This module is handled by the artisan or marketplace administrator to manage business operations efficiently.

Feature	Description
Admin Login Authentication	Validates user role and secures system accessibility
Product Management	Add/Update/Delete product listings with images and details
Price & Inventory Management	Tracks stock, fabric availability, and pricing
Order Processing	View customer orders and accept/prepare them
Custom Order Handling	Communicate with customer if needed and design according to request
Order Status Update	Update workflow from “In Progress” to “Dispatched” or “Delivered”
Customer Feedback Viewing	Understand customer satisfaction and improve product quality
Sales Monitoring	Analyze order volume and revenue metrics

4.3.3 Payment Module

- This module supports secure financial transactions.

Feature	Description
Razorpay Payment Gateway	Processes online payments during checkout
Billing & Invoice Generation	Generates transaction receipt for customers
Secure Transaction Logs	Maintains payment history and fraud protection

4.3.4 Feedback & Support Module

- This module improves customer satisfaction and trust.

Feature	Description
Ratings & Comments	Customers can rate weavers/products
Service Quality Evaluation	Admin can improve products based on feedback
Communication Channel	Helps clarify custom design specifications if needed

4.3.5 Authentication & Security Module

- Handles the privacy and safety of users.

Feature	Description
Login/Logout Management	Prevents unauthorized access
User Role Validation	Ensures only admin can manage products/data
Data Encryption	Sensitive data secured from breaches

Chapter 5: Technology Stack

5.1 Programming Languages

The development of the **Sambalpuri Bazaar** platform requires a set of modern and efficient technologies that support scalability, responsiveness, security, and ease of maintenance. The project follows a **Full-Stack Architecture** consisting of:

- **Frontend** – Client-side UI and interactions
- **Backend** – API services and business logic
- **Database** – MySQL
- **Tools & External Services** – Version control, API testing, payment integration, etc.

Frontend Technologies

Technology	Purpose	Justification
React.js	Build dynamic UI components	Faster rendering with Virtual DOM and component-based architecture
HTML5	Page structure and content	Standard for modern responsive applications
CSS3	Styling & Layout	Enhances UI aesthetics and mobile-friendly design
Bootstrap	Responsive layout and UI components	Predefined grid system reduces development effort
Axios	REST API integration	Handles secure HTTP requests with backend services

Backend Technologies

Technology	Purpose	Benefits
Spring Boot	Build RESTful backend APIs	Rapid development with auto-configuration

Technology	Purpose	Benefits
Spring Data JPA	Database communication and queries	Reduces boilerplate code, handles CRUD easily
Spring Security	Authentication and role-based access	Protects sensitive data and restricts admin functionality

Payment Integration Technology

Service	Purpose	Reason for Use
Razorpay API	Secure online payment processing	Fast UPI, card, wallet transactions with strong encryption

5.2 Database Technology

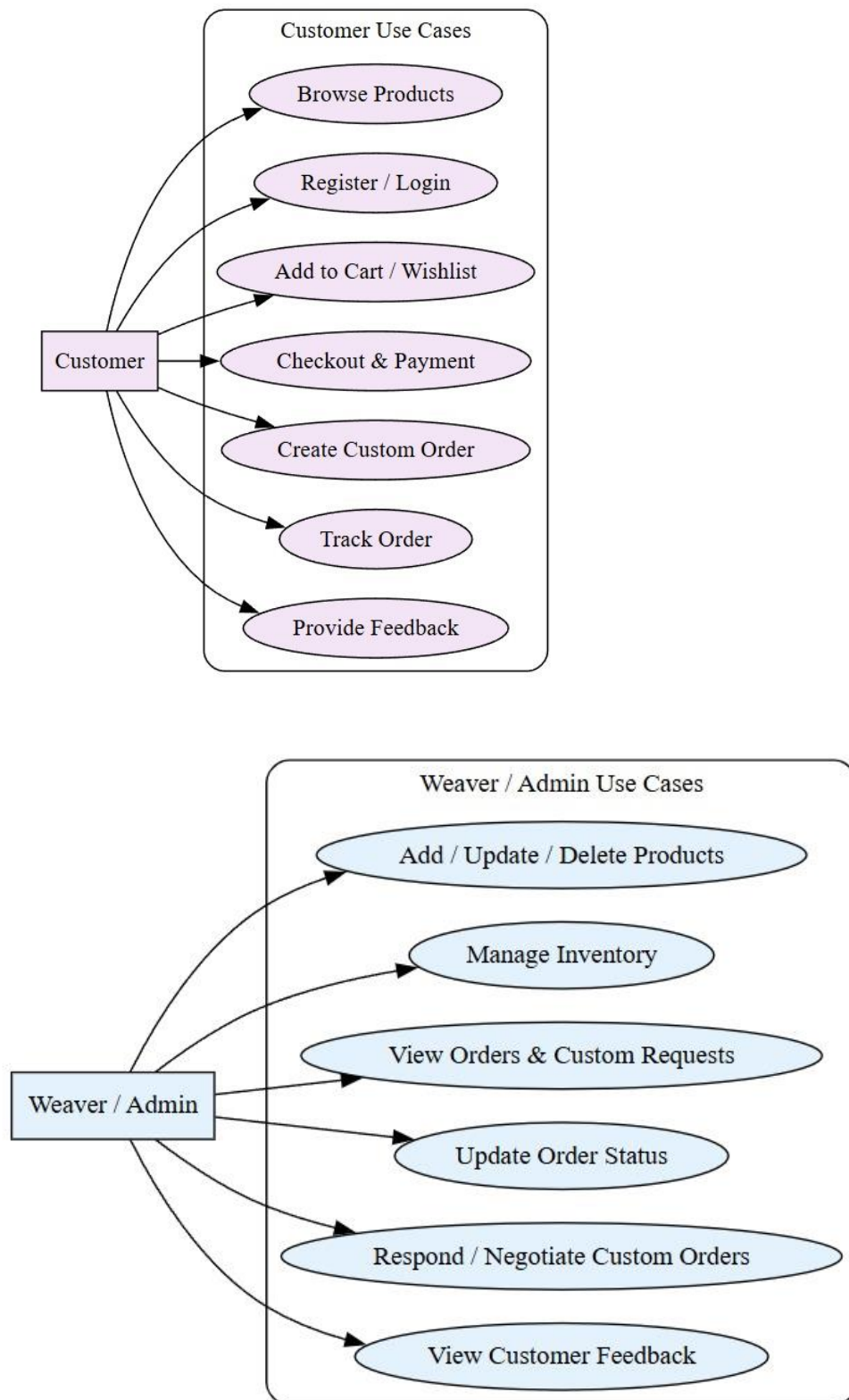
Database	Type	Reason for Selection
MySQL	SQL	Flexible structure suits product and user data

Development Tools & Supporting Services

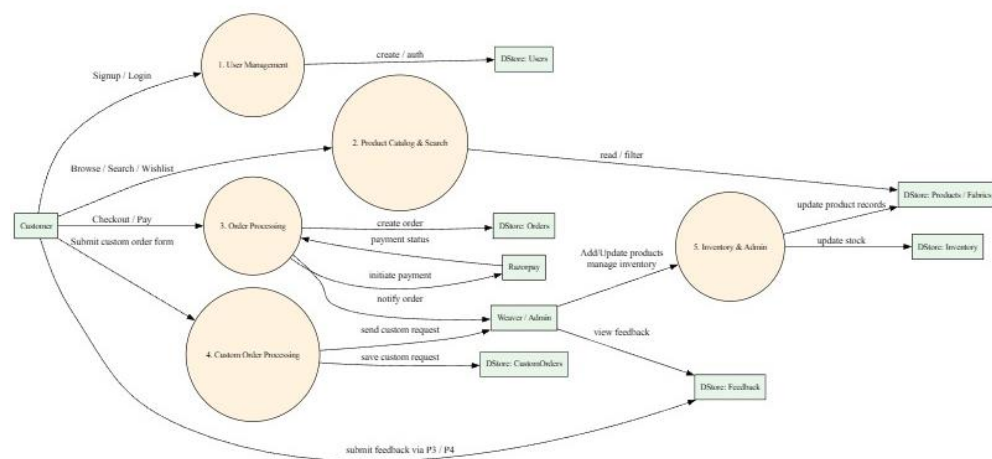
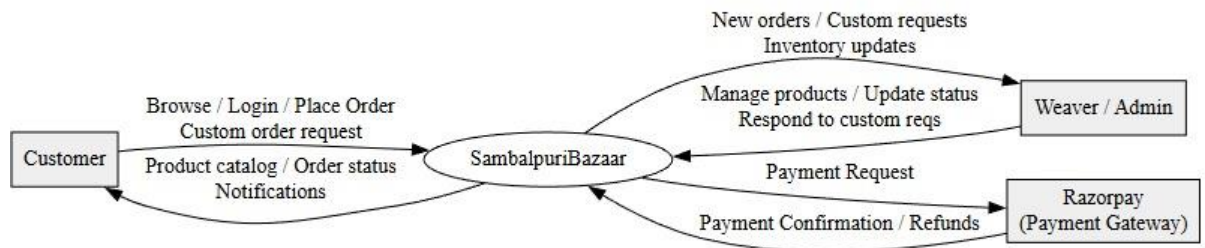
Tool/Service	Purpose
Postman	API testing and debugging
Git & GitHub	Version control and collaboration
VS Code	Frontend development environment
STS / IntelliJ IDEA	Java + Spring Boot development
Maven	Dependency and build management
Browser DevTools	UI debugging and performance checks

Chapter 6: System Design

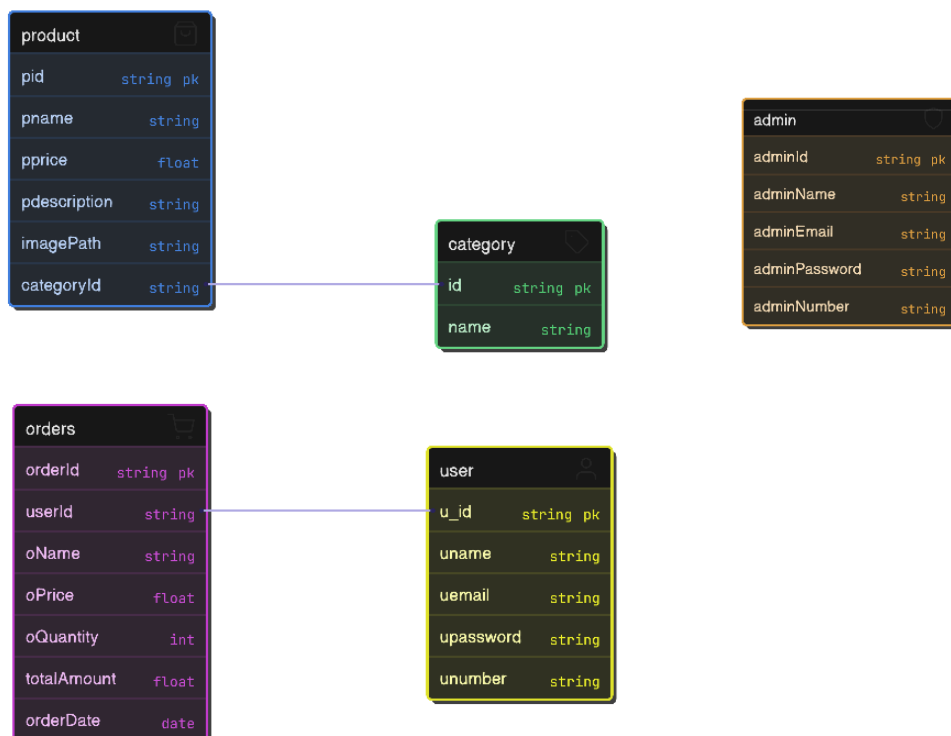
6.1 Use Case Diagram



6.2 Data Flow Diagram (DFD)



6.3 ER Diagram



Chapter 7: Implementation

7.1 Frontend Implementation

The frontend of the Sambalpuri Bazaar platform is built using **React.js**, enabling a dynamic and interactive user interface. The design emphasizes simplicity, clarity, and responsiveness to make the system accessible on desktops, tablets, and mobile devices.

React components were created for core pages such as the homepage, product listing page, product details page, shopping cart, customization form, and checkout. Routing is handled through React Router, which allows smooth navigation between pages without reloading the entire application. Axios is used to connect the frontend with backend APIs to retrieve product listings, validate user login, and submit order details.

Interactive elements like dropdowns, search bars, and image sliders enhance user engagement. Form validation ensures customers provide accurate information during login, registration, and custom tailoring requests. Overall, the frontend implementation focuses on providing a pleasant browsing and purchasing experience.

7.2 Backend Implementation

The backend has been developed using **Spring Boot**, which provides a structured and efficient way to manage server-side operations. Controllers were implemented to map RESTful API endpoints for different functionalities such as product retrieval, order processing, custom request submission, and user authentication.

Service layers handle business logic by validating user input, calculating order costs, updating inventory, and generating order status updates. The backend ensures that only authorized users can perform sensitive operations like adding products or changing order status by integrating Spring Security for role-based access.

Furthermore, exception handling and validation mechanisms were implemented to ensure reliable and error-free communication between frontend and backend layers. The backend acts as the central logic unit of the system, connecting the user interface with database operations.

7.3 Database Design

The database is created using **MongoDB**, which stores data in the form of JSON-like documents. Collections were created for storing user accounts, product details, order history, customization requests, and payment confirmations. Each collection maintains necessary attributes required for efficient retrieval and data processing.

For example, product records include attributes like product name, fabric type, size, price, stock quantity, images, and category. Orders include customer details, cart items, payment status, and timestamps. The document-oriented structure allows easy modification whenever new types of fabrics, patterns, or customization features are introduced in the future.

Indexes are used to improve search performance, particularly for product searches based on category or keywords. The flexibility of MongoDB supports the scalability of an expanding online marketplace.

7.4 API Integration

Secure online payments are enabled using the **Razorpay API**. During checkout, the frontend sends order details to the backend, which then generates a payment request through Razorpay. Users complete payment securely through their preferred digital mode, and once the transaction is confirmed, the backend updates the order status to "Paid".

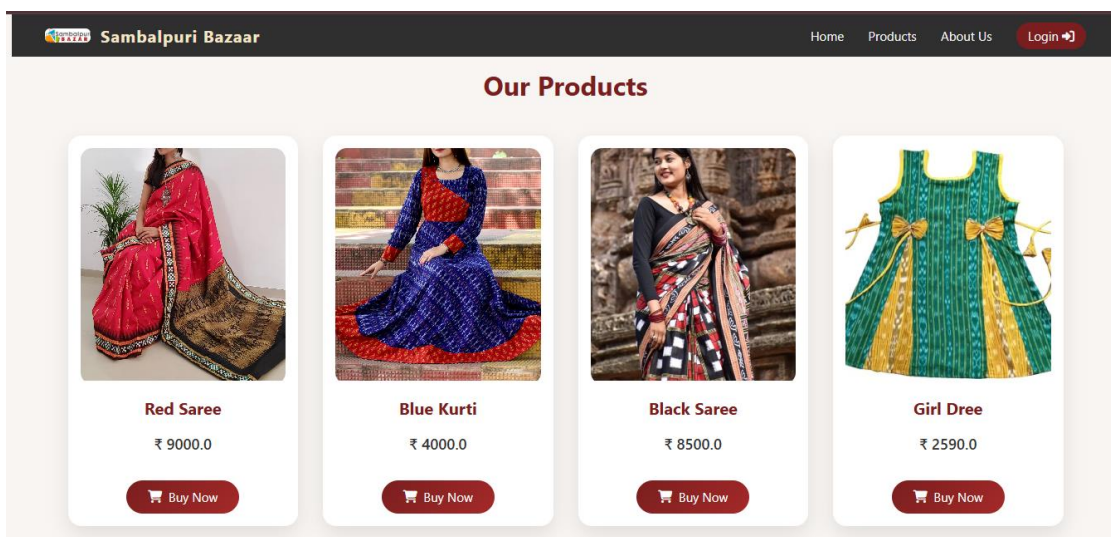
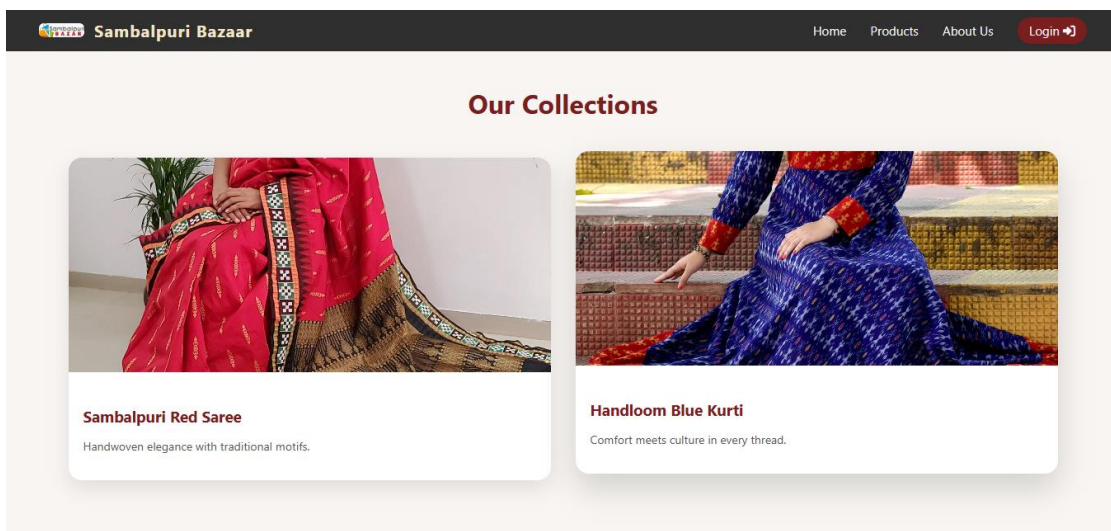
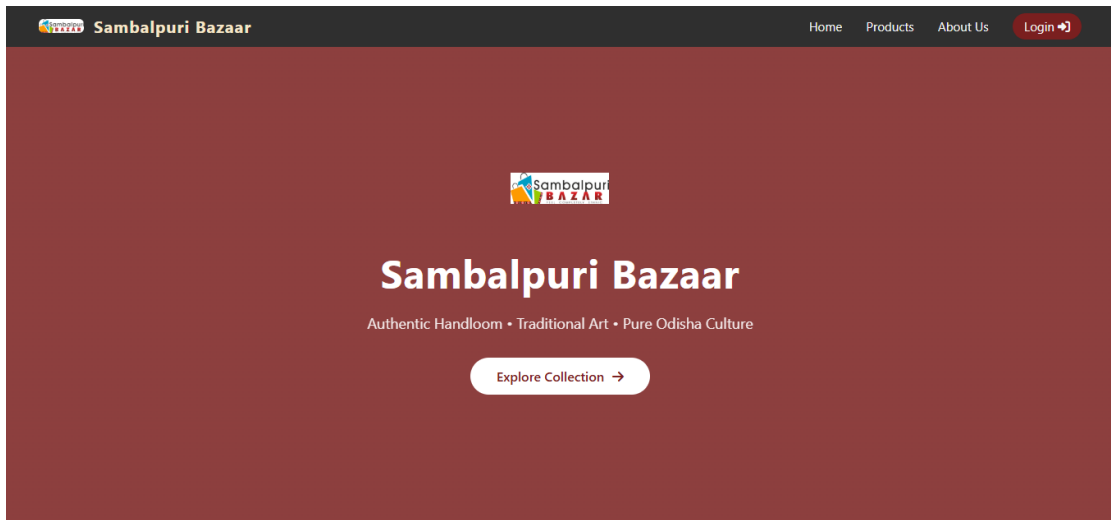
7.5 User Authentication and Authorization

To ensure system security, **JWT (JSON Web Token)** based authentication is implemented using Spring Security. Customers and Admin/Weavers have different access privileges. After a successful login, a secure token is issued, which grants access to authorized features. This prevents unauthorized users from performing operations such as altering product stock or accessing customer information.

Password encryption ensures sensitive credentials are protected within the database.

Chapter 8: Application Demonstration & Screenshots

8.1 User Interface Screens



8.2 Core Functionality Demonstration

[← Back to Dashboard](#)

Add New Product

Product Name

Eg: Sambalpuri Saree

Price (₹)

0.0

Description

Handwoven Sambalpuri traditional wear

Product Image

[Choose file](#) No file chosen

Add Product

[← Back](#)

Products

ID	Name	Price (₹)	Actions
3	Red Saree	9000.0	Edit Delete
4	Blue Kurti	4000.0	Edit Delete
5	Black Saree	8500.0	Edit Delete
6	Girl Dree	2590.0	Edit Delete
7	Girl Kurti	3400.0	Edit Delete
8	Men Kurta	5400.0	Edit Delete

[+ Add Product](#)

[← Back](#)

Admins

ID	Name	Email	Number	Actions
101	admin	admin@gmail.com	1234567890	Edit Delete

[+ Add Admin](#)

Users

ID	Name	Email	Number	Actions
1	bikash	bikash@gmail.com	7846855873	Edit Delete

[+ Add User](#)

Chapter 9: Testing

9.1 Testing Strategies

Multiple testing strategies were followed to evaluate both the functional and non-functional aspects of the application. The key strategies include:

Unit Testing

Each individual component and function—such as login validation, product retrieval API, and cart updates—was tested independently. This ensured that smaller logical units performed correctly before integrating them into the main system.

Integration Testing

Once unit components were validated, they were combined and tested together. For example, after product listing and API endpoints were successfully tested individually, they were integrated with the frontend UI to ensure proper communication over Axios.

System Testing

After integrating all modules—Customer Module, Admin/Weaver Module, Payment System, and Authentication—the complete platform was tested to verify that it meets all specified requirements. This phase ensured that the system behaves consistently on different devices and browsers.

User Acceptance Testing (UAT)

A small group of sample users tested the system to check usability, ease of navigation, clarity of instructions, and smoothness in ordering products. Their feedback helped refine minor UI adjustments and improved the user interaction flow.

9.2 Test Cases and Results

Test Cases:

Several important functionalities were thoroughly tested, such as:

- User login with correct and incorrect credentials
- Adding items to the cart and updating quantity
- Product search and filter operations
- Placing both normal and custom tailoring orders
- Payment processing through Razorpay
- Order status updates by the Admin/Weaver
- Display of ratings and feedback after delivery

During testing, certain usability issues were initially observed. For example, validation messages were sometimes unclear when incorrect data was entered in forms. These were corrected by adding more descriptive alerts and structured field validations. Minor layout issues also appeared on mobile screen sizes, which were fixed by improving responsive design using Bootstrap.

Additionally, backend validations were enhanced to prevent negative stock updates or incomplete custom order submissions. Through testing and corrections, all critical issues were resolved to ensure a smooth user experience.

Test Results:

After all identified bugs and errors were resolved, the system successfully passed the testing phase with all expected outputs matching the defined functional requirements. Both user roles experienced smooth navigation and reliable performance in all processes from login to payment and order tracking.

The positive feedback from sample users during acceptance testing confirmed that the system is user-friendly, secure, and ready for operational use. The testing process validates that **Sambalpuri Bazaar** is a dependable e-commerce solution supporting both business and cultural objectives.

Chapter 10: Results and Analysis

10.1 Performance Evaluation

The performance evaluation of the *Sambalpuri Bazaar* system focuses on assessing the efficiency, responsiveness, and reliability of the web application under normal usage conditions. The evaluation was carried out by testing various modules such as user authentication, product browsing, admin operations, and order management.

The system was tested on a standard web environment using a modern browser and local server setup. The following performance parameters were evaluated:

- **Page Load Time:**

The application pages, including Home, Products, Admin Dashboard, and Login pages, load within an acceptable time limit. Lightweight UI design and optimized database queries contribute to faster response times.

- **Database Performance:**

CRUD operations such as adding, updating, and deleting users, admins, products, and orders were executed efficiently using JPA and MySQL. The database handled multiple records without noticeable delay.

- **User Interaction Performance:**

Navigation between pages, form submissions, and data display were smooth and responsive, ensuring a good user experience.

- **System Stability:**

The system remained stable during continuous usage without crashes or data inconsistency issues.

Overall, the system demonstrated satisfactory performance suitable for small to medium-scale e-commerce applications.

10.2 Result Analysis

The implementation of the *Sambalpuri Bazaar* project successfully met all the defined objectives. The system provides an efficient platform for showcasing and managing Sambalpuri handloom products while ensuring ease of use for both users and administrators.

The following results were observed:

- Users can successfully register, log in, browse products, and place orders without errors.
- The admin module allows complete control over users, products, and orders through a structured dashboard.
- Data is stored and retrieved accurately from the database, ensuring data integrity.
- The light-themed user interface improves readability and user engagement.
- The system supports real-time updates such as product addition and order tracking.

The results indicate that the system is reliable, user-friendly, and functionally complete. The project demonstrates the practical application of web technologies such as Spring Boot, Thymeleaf, HTML, CSS, and MySQL in building a real-world e-commerce solution.

Chapter 11: Conclusion

The **Sambalpuri Bazaar** project was developed with the goal of creating a digital e-commerce platform dedicated to promoting and selling Sambalpuri handloom products. The system bridges the gap between traditional handloom artisans and the global market by providing a direct and transparent online selling opportunity. The platform combines ready-made garment shopping with custom tailoring services, offering convenience and personalization to customers while ensuring fair business value for weavers.

Throughout this project, modern full-stack development methodologies were utilized. The frontend, built using React.js, provides a smooth and interactive interface, while the backend, designed with Spring Boot, ensures secure and efficient processing of operations. MongoDB serves as a scalable and flexible data storage solution, and Razorpay integration enables trusted and seamless payments. The successful testing and deployment of the platform shows that the designed solution fulfills its intended functional and socio-economic objectives.

Achievement of Project Objectives

The project successfully meets all the objectives defined during the initial planning stage. The system allows customers to register, browse products, request custom stitching, complete secure payments, and track their orders online. On the other side, weavers and administrators are empowered with tools to manage inventory, track order status, respond to customer customization requests, and evaluate product performance through feedback.

The platform enhances user experience, ensures transparency, and reduces manual effort. More importantly, it promotes cultural preservation and ethical trade by enabling artisans to reach buyers without intermediary exploitation.

Practical Significance

The implementation of Sambalpuri Bazaar demonstrates how technology can be used to uplift heritage-based industries. The project supports traditional craftsmen in adapting to the digital economy, thereby increasing their income, productivity, and global recognition. It also aligns with national initiatives such as *Make in India* and *Vocal for*

Local, while contributing to the United Nations Sustainable Development Goal 8 — **Decent Work and Economic Growth**.

By modernizing the sales process, the platform helps protect and promote the rich cultural identity of Sambalpuri handloom weaving for future generations.

Limitations

Although the system performs effectively, some limitations remain that can be addressed in future enhancements. For example, logistics support for delivery is not automated and requires separate coordination. The system also supports only a single artisan group currently, limiting its marketplace scalability. Additionally, features like AI recommendations, chatbot assistance, and multi-language support can improve usability further, especially for international buyers and rural artisans.

Chapter 12: Future Scope

Multi-Vendor Expansion

The present system allows product and order management primarily through a single admin. In the future, the platform can be expanded into a **multi-vendor marketplace**, where multiple weavers from different regions can register, upload their products, and manage their sales individually. This approach will not only bring more variety to customers but will also create a larger market network for artisans across the state.

Mobile Application Development

To enhance portability and reach, a dedicated Android and iOS mobile application can be developed. A mobile app will provide:

- Faster accessibility over smartphones
- Push notifications for offer updates and order tracking
- Better customer engagement due to ease of use

Since many artisans and users in rural areas rely primarily on smartphones, a mobile app will significantly benefit platform adoption.

AI-Based Recommendations and Virtual Try-On

Artificial Intelligence (AI) can be integrated to study user behavior and recommend products based on browsing patterns, purchase history, and color preferences. Additionally, an AI-powered virtual try-on system could be developed, allowing users to visualize how fabrics or garments would look when worn. These enhancements will boost customer confidence and increase purchase decisions.

Logistics Automation and Delivery Tracking

Currently, delivery planning is handled manually. In future expansion, direct integration with **logistics APIs** such as India Post, Delhivery, or Blue Dart can be implemented to automate pickup scheduling, shipping label generation, and live tracking. This will reduce operational efforts for artisans and improve delivery accuracy.

International Market Enablement

Sambalpuri handloom has a strong global appeal. The system can introduce:

- International shipping support
- Multi-currency transactions
- Language localization for foreign customers

These additions will help popularize Odisha's weaving art across the world and create high-value sales for artisans.

Enhanced Communication Features

Introducing in-app chat or chatbot support can facilitate direct interaction between customers and weavers for discussing custom requirements more effectively. Using WhatsApp Business API or integrated message services will improve communication and reduce misunderstandings in measurements or design instructions.

Blockchain for Authenticity Validation

Counterfeit products are a major concern in the handloom market. Blockchain can be used in the future to register every product's origin and weave pattern details as a unique digital identity. This approach ensures 100% transparency and guarantees customers that they are purchasing authentic Sambalpuri fabric directly from skilled artisans.

Training and Digital Skill Development for Weavers

To encourage digital economy participation, the platform can include onboarding tutorials, video guides, and multilingual support to help artisans easily manage their product listings and orders online. This will remove dependency on external assistance and increase independent control.

Chapter 13: References

The following references were used to support the research, design, and development of the *Sambalpuri Bazaar* system. These include books, official documentation resources, and trusted online platforms, ensuring that all technical and conceptual materials are correctly cited.

13.1 Books & Academic References

1. Pressman, Roger S. and Maxim, Bruce R. **“Software Engineering: A Practitioner’s Approach.”** McGraw-Hill Education, 9th Edition, 2020.
2. Laudon, Kenneth C. and Traver, Carol G. **“E-commerce 2023: Business, Technology, and Society.”** Pearson Education, 2023.
3. Sommerville, Ian. **“Software Engineering.”** Pearson, 10th Edition, 2015.
4. Sharma, D.C. **“Handloom Industry of India: Growth and Challenges.”** National Handloom Development Board Publications, 2018.

13.2 Online Technology Documentation

1. **React.js Official Documentation**
<https://react.dev>
2. **Spring Boot Documentation**
<https://spring.io/projects/spring-boot>
3. **MongoDB Developer Guides**
<https://www.mongodb.com/docs/>
4. **Razor pay API Documentation**
<https://razorpay.com/docs/>
5. **Bootstrap Frontend Framework Documentation**
<https://getbootstrap.com>
6. **Axios GitHub Repository and Usage Guides**
<https://github.com/axios/axios>

13.3 Web Resources & Reports

1. Government of India — Ministry of Textiles, **Sambalpuri Handloom Industry Reports**
<https://texmin.nic.in>
2. Odisha Handloom and Textile Development Corporation — Information on Sambalpuri Weavers
<https://odishahandloom.nic.in>
3. National Handloom Development Program (NHDP) Initiatives
<https://www.india.gov.in>
4. “Tie-Dye (Bandha) Techniques of Sambalpuri Fabric” — Cultural Research Article
<https://www.craftrevival.org>

13.4 Tools & Development Resources

1. GitHub Version Control Documentation
<https://docs.github.com>
2. Postman API Platform Documentation
<https://learning.postman.com>